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09/994,264	11/26/2001	Gary Edward Pawlas	35015.003	8615
32827	7590	06/02/2005	EXAMINER	
SETTER OLLILA, LLC 2060 BROADWAY SUITE 300 BOULDER, CO 80302			MAKI, STEVEN D	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/994,264

Applicant(s)

PAWLAS ET AL.

Examiner

Steven D. Maki

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2005 and 22 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 73-76 and 78-90 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 73-76 and 78-90 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3-15-05 has been entered.

2) The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3) Claims 73-76 and 78-90 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In the amendment filed 3-15-05, the phrase "non-rigid" was added to claims 73, 75, 78-80, 82-83, 85 and 88-90. As to claims 73-76 and 78-90, the subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention (i.e. the new matter) is the subject matter of a "non-rigid" flow tube. First: There is no explicit basis for "non-rigid" in the original disclosure. Second and more importantly, the original disclosure fails to reasonably convey using a "non-rigid" flow tube. It is acknowledged that the original disclosure teaches using a

Art Unit: 1733

fluoropolymer flow tube such as a PFA flow tube instead of a stainless steel tube.

However, The original disclosure fails to provide other examples such as a rubber flow tube, a polyurethane flow tube, a closed cell foam flow tube, a flow tube free of plasticisers, etc. It is not seen how the disclosure of using a fluoropolymer flow tube such as a PFA flow tube supports non-rigid flow tubes.

- 4) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 5) Claims 73-76 and 78-90 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 73-76 and 78-90, the scope and meaning of "non-rigid flow tube" (emphasis added) is unclear. One of ordinary skill in the art is not reasonably apprised of the scope of protection required by the above noted language. The original disclosure provides no definition of "non-rigid" and as such no guidance is provided as to meets and bounds of "non-rigid". It is unclear if "non-rigid" merely excludes plasticisers (and thereby reads on stainless steel); it being noted for example that PVC having no plasticisers may be "rigid" whereas PVC sufficient plasticisers may be "non-rigid". Also, it is unclear if "non-rigid" requires the flow tube to be compressible.

- 6) The expression "non-rigid flow tube" is indefinite for the reasons given above.

With respect to application of prior art, "non-rigid flow tube" is interpreted as reading on a fluoropolymer flow tube, but excluding stainless steel flow tubes since (1) on page 6 of the response filed 3-15-05 applicant states "rigid material (stainless steel)" and thereby

Art Unit: 1733

identifies stainless steel as being "rigid" and (2) the original disclosure teaches using a fluoropolymer flow tube such as a PFA flow tube instead of a stainless steel tube.

7) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

introduce adhesive into gap using perpendicular opening

8) **Claims 73-74 and 82-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al (US 5307689) in view of van der Pol (US 6336370) and either Lanham et al (WO 01/65213) or Gomi et al (EP 997709) and in view of Japan '877 (JP 60-112877) and Storick (WO 95/06562).**

Nishiyama et al discloses manufacturing a flow meter comprising a tube (flow tube) 5; a support base (base) 3; manifold (leg) 9 having a tube opening; support part (leg) 10 having a tube opening; vibrators (drivers) 6a, 6b for the tube and pickups (pick offs) 7a-7d. In particular, Nishiyama et al teaches a method of making a flow meter comprising the steps of inserting inlet side straight tube part 5a of the sensor tube 5 in inlet 9a of the manifold (leg) 9; inserting outlet side straight tube part 5b of the sensor tube 5 in outlet 9b of manifold (leg) 9; penetrating support part (leg) 10 with tip end parts of straight tube parts 5a, 5b; holding the base end part of the sensor tube 5 using manifold (leg) 9; holding the tip end part of sensor tube 5 using support part (leg) 10; and fixing the tube to manifold (leg) 9 and support part (leg) 10. See figure 1 and col. 3

Art Unit: 1733

lines 41-52. Nishiyama et al does not specifically recite using a "non-rigid" flow tube instead of a stainless steel flow tube.

As to claims 73 and 74, it would have been obvious to one of ordinary skill in the art to use PTFE or PFA for the flow tube of Nishiyama et al's mass flow meter since Van der Pol suggests using PTFE or PFA as an alternative to metal for a flow tube of a Coriolis mass flow meter.

Furthermore, it would have been obvious to one of ordinary skill in the art to fix the tube 5 of the flow meter in the openings of the parallel legs 9, 10 by using adhesive instead of welding in view of the suggestion from Lanham et al or Gomi et al to use adhesive to attach components of a Coriolis flow meter together. Lanham et al, directed to manufacturing a flow meter having a driver and pick offs, suggests fixing using an adhesive instead of welding / brazing during manufacture of a flow meter so as to avoid microscopic cracks and thermal stresses generated by a brazing operation. See page 1 line 21 to page 2 line 6, page 3 lines 19-20, page 17 lines 1-6. Gomi et al teaches attaching flow tube 4 and outer tube 5 at both ends by either welding or adhesive bonding. See col. 5 paragraphs 19 and 20. Gomi therefore instructs one of ordinary skill in the Coriolis flow meter art to use adhesive instead of welding to attach a flow tube to another component of a Coriolis flow meter.

Lanham et al and Gomi are silent as to the details of the adhesive bonding. However, it would have been obvious to one of ordinary skill in the art to carry out the adhesive bonding suggested by Lanham et al or Gomi by injecting adhesive in an opening of each leg (this opening intersecting the above mentioned tube opening) so as

Art Unit: 1733

introduce adhesive in each gap and thereby adhere the tube to the opening in each leg since bonding parts by introducing adhesive in a gap by injecting adhesive through an opening in one part *so as to introduce a proper amount (neither too little or too much) of adhesive* between the parts is a well known adhesive bonding technique as evidenced by Japan '877 and Storwick. Japan '877 and Storwick both teach that a proper amount of adhesive is used by injecting adhesive. Japan '877 adds that bond strength is improved 10-30%. Japan '877 and Storwick both teach that this injecting adhesive technique is suitable for bonding a tube to another part. The motivation to use adhesive (avoiding thermal stress caused by the high temperature used in brazing / using adhesive as an alternative to welding to obtain the desired attachment) to bond the tube to another part (the leg) in Nishiyama et al and to look to the bonding art (e.g. Japan '877 and Storwick) comes from Lanham et al or Gomi et al.

With respect to holding, it would have been obvious to hold the section of the flow tube between the two legs in an essentially straight configuration since Nishiyama et al teaches configuring the flow tube so as to extend straight between the legs as illustrated in figure 1. Hence, Nishiyama teaches holding the tube using the manifold (leg) 9 and support part (leg) 10. As to the adhesive curing during holding, Nishiyama teaches holding the tube using the legs while fixing the tube to the legs and the secondary art to Japan '877 and Storwick, which motivate one of ordinary skill in the art to fix by introducing adhesive after assembly, teach that such adhesive can be a curable (e.g. epoxy) adhesive. It is noted that claim 73 reads on the flow tube being *held by the legs* instead of being *held by the fixture block* (claim 78). The use of the fixture block is



Art Unit: 1733

found in claim 78 instead of claim 73. In summary, the suggestion that the tube should be straight between the legs is found in Nishiyama et al. See figure 1 and description thereof at col. 3 lines 41-52 of Nishiyama et al. Second: The applied prior art teaches how to hold. Nishiyama teaches using the legs to hold. See column 3 lines 41-52 of Nishiyama et al.

As to claim 82 and 83, Van der Pol suggests using PTFE or PFA as an alternative to metal for a flow tube of a Coriolis mass flow meter.

**9) Claims 75-76 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of Van der Pol and either Lanham et al or Gomi et al and in view of Japan '877 and Storick as applied above and further in view of Adhesives Technology Handbook.**

As to claims 75-76, it would have been obvious to pretreat as claimed (i.e. etch flow tube as in claim 75 / etch flow tube with sodium naphthalene as in claim 76) since Adhesives Technology Handbook suggests surface pretreating the surfaces to ensure successful bonding wherein surface pretreatment techniques include chemical treatment such as etching / treating with acetone and sodium naphthalene (page 87). Adhesives Technology Handbook teaches preparing surface of PFA using sodium naphthlanene.

As to claim 84, it would have been obvious to use cyanoacrylate adhesive since Adhesives Technology Handbook discloses cyanoacrylate adhesives as forming a strong bond between many materials without the need for heat (page 141).



Art Unit: 1733

10) **Claims 85-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Japan '877 and Storick as applied above and further in view of Cage '827 (US 5753827).**

As to claims 85-87, it would have been obvious to one of ordinary skill in the art to align and attach the driver and pickoff to the tube in Nishiyama et al's Coriolis flow meter using adhesive since (1) Nishiyama teaches arranging the driver and pickoff on the flow tube and (2) Cage '827, also directed to a Coriolis flow meter, suggests attaching such components on the tube using adhesive (col. 7 lines 20-50).

11) **Claims 88 and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Japan '877, Storick and Cage '827 as applied above and further in view of Cage '060 (US 6439060).**

As to claims 88 and 89, it would have been obvious to one of ordinary skill in the art to test as claimed in view of Cage '060's suggestion to test a Coriolis flow meter by a process including vibrating the flow meter, measuring the vibration and adjusting masses so as to balance the flow meter.

12) **Claim 90 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Japan '877 and Storick as applied above and further in view of McLaughlin (US 3352960).**

Art Unit: 1733

As to claim 90, it would have been obvious to one of ordinary skill in the art to manufacture the flow tube as claimed in view of (1) the above noted suggestion from van der Pol to use plastic (PTFE or PFA) for Nishiyama et al's flow tube having straight portions connected by a bent portion, (2) Mclaughlin's teaching to extrude a straight tube and then heat and bend the straight tube to form a bent plastic tube and (3) it is taken as well known / conventional per se in the extrusion art to pass an extruded tube through a cooling region while holding the tube, for example with pair(s) of rollers, so as to form a straight plastic tube.

introducing adhesive directly in each gap and using fixture

13) **Claims 73, 78 and 82-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Binnie et al (US 5837090) and Wiechowski et al (US 4244768).**

Nishiyama et al is discussed above.

As to claim 73, it would have been obvious to one of ordinary skill in the art to use PTFE or PFA for the flow tube of Nishiyama et al's mass flow meter since Van der Pol suggests using PTFE or PFA as an alternative to metal for a flow tube of a Coriolis mass flow meter.

Furthermore, it would have been obvious to one of ordinary skill in the art to fix the tube 5 of the flow meter in the openings of the parallel legs 9, 10 by using an adhesive instead of welding in view of the suggestion from Lanham et al or Gomi et al to use adhesive to attach components of a Coriolis flow meter together. Lanham et al,

Art Unit: 1733

directed to manufacturing a flow meter having a driver and pick offs, suggests fixing using an adhesive instead of welding / brazing during manufacture of a flow meter so as to avoid microscopic cracks and thermal stresses generated by a brazing operation.

See page 1 line 21 to page 2 line 6, page 3 lines 19-20, page 17 lines 1-6. Gomi et al teaches attaching flow tube 4 and outer tube 5 at both ends by either welding or adhesive bonding. See col. 5 paragraphs 19 and 20. Gomi therefore instructs one of ordinary skill in the Coriolis flow meter art to use adhesive instead of welding to attach a flow tube to another component of a Coriolis flow meter.

Lanham et al and Gomi are silent as to the details of the adhesive bonding. However, it would have been obvious to one of ordinary skill in the art to carry out the adhesive bonding suggested by Lanham et al or Gomi by directly introducing adhesive in each gap since Binnie et al and Weichowski et al, which like Nishiyama et al assemble a "tubular structure" in holes of "other structures" suggest inserting the tubular structure in the holes in the other structures and then introducing adhesive in each gap so that the gap is completely filled by the adhesive and the desired bond thereby obtained.

With respect to holding, it would have been obvious to hold the section of the flow tube between the two legs in an essentially straight configuration since Nishiyama et al teaches configuring the flow tube so as to extend straight between the legs as illustrated in figure 1 and Binnie et al motivates holding the tube during introduction and cure of the adhesive so that the tube and legs are held solidly and reliably in the desired positions relative to each other. Hence, Nishiyama teaches holding the tube using the

Art Unit: 1733

manifold (leg) 9 and support part (leg) 10. As to the adhesive curing during holding, Nishiyama teaches holding the tube using the legs while fixing the tube to the legs and the secondary art to Binnie et al and Weichowski et al, which motivate one of ordinary skill in the art to fix by introducing adhesive after assembly, teach that such adhesive can be a curable (e.g. epoxy) adhesive. It is noted that claim 73 reads on the flow tube being *held by the legs instead of being held by the fixture block* (claim 78). The use of the fixture block is found in claim 78 instead of claim 73. In any event: When using the technique of introducing adhesive after assembly, Binnie et al motivates holding the tube during introduction and cure of the adhesive so that the tube and legs are held solidly and reliably in the desired positions relative to each other (col. 4 lines 20-27). In summary, the suggestion that the tube should be straight between the legs is found in Nishiyama et al. See figure 1 and description thereof at col. 3 lines 41-52 of Nishiyama et al. Second: The applied prior art teaches how to hold. Nishiyama teaches using the legs to hold. See column 3 lines 41-52 of Nishiyama et al. Binnie et al teaches using clamp structures to hold. See col. 4 lines 20-27.

As to claims 78, the limitation of using a fixture having first and second sections would have been obvious since Binnie et al (col. 4 lines 20-27) suggests clamping the tubular structure during bonding in order to hold the tubular structure solidly and reliably in the desired position during bonding and Wiechowski et al specifically teaches a clamp as having a first section 32 and a second section 34 (figure 12).

As to claims 82 and 83, Van der Pol suggests using PTFE or PFA as an alternative to metal for a flow tube of a Coriolis mass flow meter.

Art Unit: 1733

**14) Claims 75-76 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Binnie et al and Wiechowski et al as applied above and further in view of Adhesives Technology Handbook.**

As to claims 75-76, it would have been obvious to pretreat as claimed (i.e. etch flow tube as in claim 75, etch flow tube with sodium naphthalene as in claim 76) since Adhesives Technology Handbook suggests surface pretreating the surfaces to ensure successful bonding wherein surface pretreatment techniques include chemical treatment such as etching / treating with acetone and sodium naphthalene (page 87) and roughening (e.g. page 89). Adhesives Technology Handbook teaches preparing surface of PFA using sodium naphthalene.

As to claim 84, it would have been obvious to use cyanoacrylate adhesive since Adhesives Technology Handbook discloses cyanoacrylate adhesives as forming a strong bond between many materials without the need for heat (page 141).

**15) Claims 85-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Binnie et al and Wiechowski et al as applied above and further in view of Cage '827 (US 5753827).**

As to claims 85-87, it would have been obvious to one of ordinary skill in the art to align and attach the driver and pickoff to the tube in Nishiyama et al's Coriolis flow meter using adhesive since (1) Nishiyama teaches arranging the driver and pickoff on

Art Unit: 1733

the flow tube and (2) Cage '827, also directed to a Coriolis flow meter, suggests attaching such components on the tube using adhesive (co. 7 lines 20-50).

**16) Claims 88-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Binnie et al, Wiechowski et al and Cage '827 as applied above and further in view of Cage '060 (US 6439060).**

As to claims 88 and 89, it would have been obvious to one of ordinary skill in the art to test as claimed in view of Cage '060's suggestion to test a Coriolis flow meter by a process including vibrating the flow meter, measuring the vibration and adjusting masses so as to balance the flow meter.

**17) Claim 90 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama et al in view of van der Pol and either Lanham et al or Gomi et al and in view of Binnie et al and Wiechowski et al as applied above and further in view of McLaughlin (US 3352960).**

As to claim 90, it would have been obvious to one of ordinary skill in the art to manufacture the flow tube as claimed in view of (1) the above noted suggestion from van der Pol to use plastic (PTFE or PFA) for Nishiyama et al's flow tube having straight portions connected by a bent portion, (2) McLaughlin's teaching to extrude a straight tube and then heat and bend the straight tube to form a bent plastic tube and (3) it is taken as well known / conventional per se in the extrusion art to pass an extruded tube through a cooling region while holding the tube, for example with pair(s) of rollers, so as to form a straight plastic tube.

**Allowable Subject Matter**

**18) Claims 79-81 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112 set forth in this Office action and to include all of the limitations of the base claim and any intervening claims..**

Scrantom et al, directed to method of applying terminations to ceramic bodies, shows the use of apertures and alignment means to align components in a desired manner. However, there is no motivation in the prior art of record including Scrantom and Cage '827, to further modify Nishiyama et al, Lanham et al / Gomi et al, Binnie et al and Wiechowski et al such that a driver is attached to the flow tube using the driver opening and at least one pick off is attached to the flow tube using the at least one pick off opening as set forth in claim 79.

**Remarks**

19) Applicant's arguments with respect to claims 73-76 and 78-90 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 3-15-05 have been fully considered but they are not persuasive. With respect to "non-rigid", van der Pol provides ample suggestion to use fluoropolymer such as PFA or PTFE instead of stainless steel.

20) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

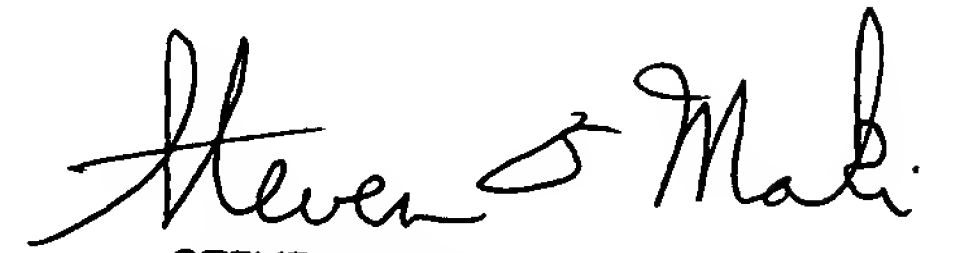
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Art Unit: 1733

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven D. Maki  
May 27, 2005

  
STEVEN D. MAKI  
PRIMARY EXAMINER  
~~GROUP 1300~~  
AU 1733

5-27-05